

5. Historicity, Astronomy and Kaliyuga

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Introduction : Kali era has been discussed by many scholars in this world. Though the Kali era has been relegated to background by the Indian government itself, the western scholars in particular have not done so even today. When there was conjunction on May 5, 2000, they started discussing about it since 1997 and the conjunction of 3102 was referred to. In Indian context, the Kali Yuga and Era have been so intimately connected with the literary, astronomical, epigraphical, social, cultural and other fields and subjects, that no research could be possible without its knowledge. Astronomical methods have been widely used for time reckoning and recording. The historicity and astronomy connected with the concept, evolution, observation, recording and application of Kaliyuga are discussed in this paper.

The Historicity of Kaliyuga: Generally, scholars have opined that Aryabhata in 499 CE has only introduced the Kali era. But, the concept, evolution, observation and recording of Kali and Kaliyuga in the astronomical context could be traced back to the Vedic period, which has been shown based on literary and epigraphical evidences.

1. That Aryabhata used Kali Era in his work does not exclusively prove the fact that it was not

used by others or not in vogue prior to him. Without the prevalent of such concepts, precepts and practices, he could not have invented all of a sudden without pre-knowledge.

2. Aryabhata mentions vyatipata in relation to conjunction of planets (Aryabhatiyam - Kalakriya.3): The (combined) revolutions of the Sun and the Moon added to themselves is the number of vyatipatas (in a yuga). The concept and phenomenon of vyatipata is dated back to Vedic period and definitely to Vedanga-Jyotisa in Gathas 291-293 (c.1400 BCE). This proves that Vedic astronomical methods continued from 1400 BCE onwards.

3. The Surya Siddhanta, definitely dated before Aryabhata, though differently by different scholars, records the four yugas in detail mathematically and astronomically. The work claims that it was written in 21,64,960 YBP or 21,64,958 BCE (1.3) as revealed to Mayasura (an Asura named Maya or an astronomer) through Surya (the Sun). Modern scholars date to 3rd cent. BCE, 3rd cent. CE, 400 CE, 11th cent. CE and so on.

4. In any case, it is dated before Aryabhata and such reckoning was in existence before such periods.

5. The important feature of Indian astronomical works has been that they have been amended and corrected periodically taking new and modern concepts into account with due acknowledgement and criticism also. Thus, the corrected data appears

to be later dated i.e, the date of correction carried out makes it new. Therefore taking the date of correction as the date of work is totally wrong.

6. That the Indian astronomical works had been corrected continuously based on observations and calculations is a fact. For example, John Bentley, gives the table of errors in the position of the planets, as calculated, for successive periods - 3102 BCE, 2102 BCE, 102 BCE, 538 CE and 1091 CE, according to Surya Siddhanta, fixes the date as 1091 CE for the work. This clearly proves that such corrections could have been carried on in the respective periods after observation.

Following are some points with respect to Kaliyuga conjunction:

1. The Conjunction, which is associated with the Kaliyuga, is the conjunction of all planets, in other words, the planets are in the same line from the Sun and not with Triple Conjunction, as has been implied and argued by some scholars.

2. They are Mercury, Venus, Earth, Moon, Mars, Jupiter and Saturn (as other planets were not considered by the ancients.)

3. This is reportedly said to have been observed from Ujjain during the Surya Siddhanta period and later registered by Aryabhata that it was observed from Lanka.

4. However, according to these works, both are in the same longitude (the Sanskrit astronomical

works record that Astinapura, Avanti/Ujjaini, Kumari / Kanyakumari and Lanka were in the same longitude.)

5. Therefore comparing the distances between the planets and their distance from the Sun, and to the distance between these two places on the surface of the earth, it is very very negligible. Thus, the different places of observation as mentioned in the works cannot be taken for argument for dispute, as has been done by some scholars.

6. However, the significant point is that an observer on the earth facing Sun could notice the conjunction of Sun, Mercury and of course Earth.

7. And another observer on the earth, exactly opposite to that of the first observer on the other side of the earth could observe the conjunction of Moon, Mars, Jupiter and Saturn.

8. Thus, in reality none could have observed the conjunction of all planets from the earth simultaneously, unless the observers had pre-knowledge of such conjunction and observed from two or more points on the earth to observe half or quarter part of the observation and then, came together to discuss their observations to arrive at a conclusion to record such conjunction.

9. Thus, any claim of observing the conjunction by a single person or at a single point on the earth is false.

10. Any astronomer of India, therefore at any time had/has never claimed that he had/has observed such conjunction, but recorded the possibilities of such conjunctions at a particular period of time.

11. Surya Siddhanta repeatedly mentions that the cities Lanka, Yavakoti, Siddhapura and Romaka were situated exactly at 90° on the earth at equator. (Now, we locate the places: they are in the Indian Ocean (Lanka, not Sri Lanka), Pacific Ocean, Atlantic and Pacific Ocean) Therefore, Lanka and Siddhapura were opposite to each other.

12. Thus, if one observer observes during night from one side of Lanka, the other observer observes during day time from Siddhapura. Ujjaini was the Prime Meridian of India in those days (known as Avanti earlier, a place of learning for Indian Arts and Sciences).

13. Thus, the recordings of Surya Siddhanta and Aryabhatiya are taken to be correct considering the factual position.

14. Moreover, unless they had the pre-knowledge of the previous or earlier conjunction, they could not have anticipated, got prepared, sent different observers for the places marked and made such observation situated at two different places (or four) at a distance of 1,27,56,000 Kms! And that they could have observed means, they must have had such knowledge. The modern man could ask

as to how they knew, how they observed, what instruments they used to observe and so on!

15. Though the word "conjunction" is widely used, astronomers prefer to use, "alignment" as the planets are located on the ecliptic plane. As viewed from the Earth, they are always 'lined up' across the sky! Whether it is a normal planetary conjunction or a grand conjunction, the planets are aligned in a small region of sky with a small separation of angle. In other words, during any conjunction or alignment observed now through satellite sources and visualized as if viewed from the earth, the planets would not be exactly in a straight line. But, Surya Siddhanta talks about the Grand Conjunction on February 17/18th 3102 BCE, when all planets were lined up.

Proofs for the Existence of Continuous Astronomical Observations: There are specific astronomical observations as had been recorded in the Vedic literature. As the data recorded has been so meticulous, such recording would have been possible only by actual observation and not by working backwards with the known and recorded observations at a later date. Some observed and dated recordings are as follows:

1. According to Kausitaki Brahmana, (i) the Sun reached the winter solstice at the full moon of Magha (XIXZ.3), (ii) the year was considered to be at its end and the full moon at the star group Purva Phalguni (v.1) (iii) the Krittika (Pleiades group) rose exactly at

the east (Satapata Brahmana.II.1.2.3) and that the spring set in one day after the new moon of Caitra. From all these, it can be noted that the summer solstice of the earliest Brahmanical period passed by nearly through the star Leonis and that date was 3100 BCE.

2. Satapatha Brahmana (2.1.2.3) mentions that the asterismal group Kritika never swerve from the east, while others do. The Sayanacharya's commentary too notes this significance. This statement points to the observation made about 2950 BCE.

3. There is a cycle of sixty years beginning with Prabhava and ending with Aksaya. The Vedic verse "Sastischa trimsaka valga suklakrishnau cha sastikau" connotes that the cycle of sixty made thirty revolutions and that the northern and southern Ayanas were also sixty each (Rgveda.1.3)

These references point to the continuous observations made by the Indian astronomers since 3100 BCE. According to Shamasastri, the sixty years' cycle era has a close relation with Aryabhata calculation (Shastyabda) and with Kali Era reckoning. He argues that it was prevalent during Aryabhata's time under the name of "Brahmaspatyabda".

Aryabhata corrected the theory, replacing the Persian World-Year 360,000 years by a period twelve times as large, a Mahayuga, which enabled him to

adapt the theory to observations made in his own time. Such a theory has been proposed by some scholars.

But there is no proof that Aryabhata corrected the theory, replacing the Persian World-Year 360,000 years by a period twelve times as large, a Mahayuga. The figure $360,000 \times 12 = 4,320,000$ is not obtained or derived but it is the number of eastward revolutions made by the Sun in a Yuga (Aryabhatiya. Gitika.3-4). It is also equal to 1,57,79,17,500 civil days in a yuga, $43,20,000 \times 365.2586805556$.

In fact, he gives the number of revolutions for Moon, Moon's apogee, Moon's ascending node, Mars, Sighrocca of Mercury, Jupiter, Sighrocca of Venus and Saturn specifically. Could anybody have invented such numbers without any astronomical devices?

Other points are discussed as follows:

The idea of deluge definitely originated from India and spread to other civilizations as pointed out by William Jones, Blavatsky, P.J. Marshall and others. There has been much discussion about it.

Was India existing with Astronomers in 3102 BCE to observe the Conjunction?

This is a crucial question to be answered. Historians argue that India does not have historical records before Mauryan period (300 BCE), as the proto-historical records of Indus Valley Civilization (3500-2500 BCE) could not have been deciphered.

Here, it has to be noted that though the script has not been deciphered, historically, the period cannot be decided as unhistorical. The following historical facts should be kept in mind to decide the historicity of astronomy of India.

1. Sanskrit is the oldest language of the Indo-European language group and the Vedas are the most ancient scriptures.

2. Since the Vedas have been dated to different periods (c.8500-2500 BCE), their antiquity is not doubted. Therefore, such intellectual development of the people could not have been attained all of a sudden and therefore, the origin of such intellectuality has to be dated before the Vedas.

3. The trading of Indian goods is dated back to c.3500 BCE and therefore, the connected Indian capabilities have to be dated back to even prior date.

4. The decimal number system with numbers from zero to infinity invented by the Indians has been very important, since philosophy, epistemology and other thinking and logical processes are involved behind it. All these precepts, concepts and evolution could be traced back to the Vedas (c.4500-3500 BCE)

5. The precepts, concepts, and evolution of theories about planets, asterism and cosmos are also found in the Vedas.

But, the scholars so far have theorised that the Indians borrowed from the Babylonians, Greeks, Persians and so on. In the archaeological context,

there are evidences for the existence of a civilized state as compared to Egypt and middle-east or even other more civilized people. However, unwittingly, the existence of trade and movement of goods from India to those so called "ancient advanced civilizations during 4500-3500 BCE" have been accepted and recorded (Rawilson, Kennedy etc). Then, India could not have existed without such capabilities to produce the required goods and to export to other countries.

Behind the produced and manufactured goods were the Indians with such skills and capabilities. Refined techniques point to the usage of gadgets and machines. Sailing of ships implies the ship building techniques, navigational methods and the instruments used.

Historians cannot ignore these evidences of the material period to deny the astronomical capabilities of the Indians. Giovanni Domenico Cassini, John Palyfair, La Place, Jean Sylvian Bailly, Erard Molilien, Almaq Riccoli, Henry Thomas Colebrook and others verified the Indian tables and came to the conclusion that they were based on observed conjunction. Therefore, it is argued that India had the recognizable civilized state during the material period with capabilities to have astronomers and observe conjunction in 3102 BCE.

The Myth and Significance of Numbers 432, 4,320, 4,32,000, 43,20,000 etc: Not only the Indian tradition, but also other traditions have been

preserving the myth of these numbers consciously. However, while it is found that such tradition was traced back to Indian or Hindu, the western scholars have suppressed and hidden the facts.

The Jewish and Christian tradition and mythology has been so imbibed with the idea of the birth of their Messiah on the lunar year of 4320! Dr Sepp quotes from De Mirville:

'...It was written in the stars of firmament that the Messiah would be born in the lunar year of the world 4320, in that memorable year when the entire choir of the planets would be celebrating its jubilee".

The Jews had evidently and undeniably borrowed from the Chaldeans, along with the Chaldean gods. They turned the 4,32,000 years of the Chaldean Divine Dynasties into 4,320 lunar years from the world's creation to the Christian era!!

Every scholar is aware, of course, that the Chaldeans claimed the same digits (432) or 4,32,000, for their Divine Dynasties as the Hindus do for their significant number 43,20,00.

As these figures, according to ancient writers, were based by Berossus on the 120 Saroses – each of the divisions meaning six Neroses or 600 years each, making a sum total of 432,000 years ($120 \times 600 \times 6$) – they would appear to be peremptory, remarks De Mirville.

Thus, it is evident that the figures have not come from vacuum; but well preserved in the

traditions of the old civilizations. Therefore, the possibilities are if such notation was practised by the Chaldeans and later the Jews borrowed from them, then, their tradition and chronology should have followed it. But, it was only the Hindus, who have been preserving and following such traditions even today. Therefore, it is evident and indisputable that from the Hindus only they must have derived it and its remnants still preserved in their traditional literature. Because of this coincidence as well as the facts behind, obviously, the Westerners started the canard that Hindus derived or borrowed their astronomy from the Chaldeans, Greeks and so on.

J. Fillizoat explains that in the *Surya Siddhanta*, it is stated that in a *Mahayuga* (43,20,000) the circle of asterism falls back eastward by thirty score ($30 \times 20 = 600$) revolutions. Thus, the time of a complete libration is 600th part of the period 43,20,000 years i.e., 7,200 years. If the limits of the libratory movement from the fixed point to be 27 degrees in either direction, it gives the annual rate of motion of equinox 54 seconds, which is a remarkable approximation to the modern value of about 53 seconds per year. He also points out that the Indian concept of great year 10,800 or cosmic cycle 4,32,000 has influenced the Greek and Babylonian astronomers.

Encyclopaedia of Astrology says:

'This Mahayuga of the Hindus is a period of approximately, 4,320,000 years, in which they

say all the planets recur at nearly the same position. The astronomer Stuart showed that this is correct and the period is 4,319,936.8663 years; at the end of which Mercury, Venus, Earth, Mars, Jupiter and Saturn return to a position in the fixed zodiac about 202 behind where they started. He found that this also applies to the 'new' planets, Uranus and Neptune; and that an increase in the period of Pluto of only one part in 100,000 or 0.001 per cent, will also bring it into recurrence".

Conclusion:

Based on the above discussion, following conclusions are drawn-

1. The Kali Era reckoning has origins in the Vedas, particularly, in the sixty years' cycle.
2. There had been different groups of observers engaged continuously to observe different astronomical events. Thus, each group engaged in observing and recording rotation of planets, eclipses, sixty years' cycle, asterism, conjunction of planets, and so on.
3. The Asokan inscriptions prove the usage of Kalpa and yuga datable before 300 BCE. The Aihole inscription conclusively proves the historical usage of both Eras - Kali and Saka - in the historical context.
4. Aryabhata's mention of Kaliyuga only reaffirms its continuous usage instead of its introduction by himself.

5. The absence of astronomical instruments as conceived, and perceived by the modern minds to make such actual observations is not a valid point, as such instruments could have been perished because of the period 2000-3000 YBP involved.

6. Moreover, such argument could be extended to other ancient countries also to question the claims made about them. As the description of gnomon, sundial, water clock and other instruments are available, such instruments must have been used.

7. Without explaining the gap of 2500 years between Indus Valley civilization (c.4500-2500 BCE) and Mauryan period (500-300 BCE), the history cannot be started from scratch, as if nothing happened in India. Therefore, the conjunction in 3102 BCE associated with Kali era is historically explicable.

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Note: (3102 BCE stands associated with Kali Era. This point has been well established in this article. But the point to be noted here is that this Kali ends on 27-12-3101 B.C.-Editor)